

Application Serial No. 10/663,077
Reply to Office Action of February 14, 2008

PATENT
Docket: CU-6013

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REMARKS

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In the Office Action, dated October 30, 2006, the Examiner states that Claims 1, 2, 5 and 8-15 are pending and Claims 1, 2, 5 and 8-15 are rejected. By the present Amendment, Applicant amends Claims 1 and 5, and adds new Claims 16 and 17.

In the Office Action, Claims 1, 2, 5, and 10-11 are rejected under 35 U.S.C. § 102(b) as being anticipated by Shvartsman (U.S. 5,279,689). Claims 1, 2, 5 and 10-11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Edwards (WO 99/52105), in view of Nebashi et al (U.S. 6,120,870) and Takahashi et al. (JP 02-010536). Claims 1, 2, 5 and 10-11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Edwards in view of Nebashi et al. and Takahashi et al., and in further view of Parker et al. (U.S. 5,327,825). Claims 1, 2, 5, and 10-11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over by Shvartsman in view of Ueda et al. (JP 02-010536) or Sakguchi (JP 05-046063). Claims 1, 2, 5, and 10-11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over by Shvartsman alone or combined with Ueda et al. or Sakguchi in view of Parker et al. Claims 1, 2, 5 and 10-11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Webster et al. (U.S. 4,892,385) in view of Martens (U.S. 4,576,850). Claims 1, 2, 5 and 10-11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Webster et al. in view of Martens combined with Ueda et al. or Sakguchi. Claims 1, 2, 5 and 10-11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Webster et al. in view of Martens combined with Ueda et al. or Sakguchi. Claims 1, 2, 5 and 10-11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Webster et al. in view of Martens alone or combined with Ueda et al. or Sakguchi, and in further view of Parker et al. Claims 1, 2, 5 and 8-15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Webster et al. combined with Martens and Parker et al alone, or further combined with Ueda et al. or Sakguchi, in view of Yoshitake et al. (U.S. 5,991,078) or Sakuri et al. (U.S. 3,911,479). Claims 1, 2, 5 and 8-15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Shvartsman and Parker et al. alone, or combined with Ueda et al. or Sakguchi, further in view of Yoshitake et al. or Sakuri et al.

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In light of the rejections, the Applicant has amended independent Claims 1 and 5 to specify that a ratio of each cross-sectional area above the midline of each peak-like shape to each cross-sectional area below the midline of each valley-like shape is from 0.95 / 1.05 to 0.8/1.2. This feature is not disclosed in any of the cited references, and therefore, the present invention is not anticipated by or obvious in view of the cited references.

In the present invention, the peak-like and valley-like shapes of the duplication plate material and those of the optically diffractive layer are not formed to be completely complementary to each other. The invention finally obtains an optically diffractive structure having a corrugation-like shape in which the width of each valley-like shape and that of each peak-like shape are almost even, by using a duplication plate material designed to have valley-like shapes having a wide width and peak-like shapes having a narrow width, more specifically, a ratio of each cross-sectional area above the midline of each peak-like shape to each cross-sectional area below the midline of each valley-like shape is from 0.95 / 1.05 to 0.8/1.2. (see FIG. 5(C) and page 18, line 21, line 14 of the specification). More particularly, in order to finally obtain an optically diffractive structure having a ratio of cross-sectional areas above the midline of peak-like shapes to cross-sectional areas below the midline of valley-like shapes of almost "1", duplication accuracy is increased by intentionally using a duplication plate material which allows the ratio of cross-sectional areas above the midline of peak-like shapes to cross-sectional areas below the midline of valley-like shapes to be more than "1", for example, from 0.95/ 1.05 to 0.8/1.2. Thus, in the present invention, it is possible to observe increasingly brighter diffraction borrowed light and provide desired visual effects to the hologram and diffraction grating. (see page 15, line 26 – page 16, line 2 of the specification).

The stamper of Shvartsman does have some cross-sectional areas above the midline of peak-like shapes, which are smaller than the cross-sectional areas below the midline of adjacent valley like shapes; however, the relationship is not established between all the stamper's adjacent peak-like shapes and valley-like shapes, as it is in the present invention. In Shvartsman, some of the peak-like and valley-like the width of each are almost the same. As is clear in FIGs. 2d and 2e, Shvartsman discloses that

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the peak-like and valley-like shapes (peaks and grooves) of the stamper and those of the photohardenable layer are formed to be completely complementary to each other. Because Shvartsman teaches this feature, it is not possible to conceive a design where the peak-like and valley-like shapes of a duplication plate material and those of an optically diffractive layer are not formed to be completely complementary to each other. Therefore, the present invention is distinguishable from Shvartsman. Furthermore, unlike that which is claimed in the present application, Shvartsman does not disclose "all cross sectional areas above a midline of peak-like shapes are smaller than all cross-sectional areas below the midline of valley-like shapes adjacent to said peak-like shapes, the midline being a line drawn by connecting midpoints of the height of each peak-like shape, and a ratio of each cross-sectional area above the midline of each peak-like shape to each cross-sectional area below the midline of each valley-like shape is from 0.95 / 1.05 to 0.8/1.2" in order to finally obtain a desired optically diffractive structure in which the width of each valley-like shape and that of each peak-like shape are almost even so as to increase diffraction borrowed light. Therefore, the Applicant believes the anticipation and obviousness rejections based on Shvartsman should be deemed overcome.

Furthermore, as shown in FIG. 5(B) of the present application, if a duplication plate material in which the width of peak-like shapes is wider than that of valley-like shapes is used, resin can hardly enter the valley-like shapes of the duplication plate material so as to form a shallow embossed layer; thus, duplication accuracy is decreased. Also, as shown in FIG. 5(A) of the present application, by using a duplication plate material in which the width of each peak-like shape is designed to be almost uniform with that of each valley-like shape, the peak-like shapes of the optically diffractive layer obtained by embossing become smaller; thus, diffraction borrowed light gets darker and visual effects thus obtained are deteriorated.

Consequently, when using the duplication plate material disclosed in Shvartsman, wherein some cross-sectional areas above the midline of peak-like shapes are smaller than the cross-sectional areas below the midline of adjacent valley-like shapes, and in other peak-like and valley-like shapes the width of each peak-like shape is almost the same as that of each valley-like shape, the peak-like shapes of the

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optically diffractive layer obtained by embossing become smaller, such as shown in 5A of the present application; and thus, diffraction borrowed light gets darker and visual effects obtained are deteriorated.

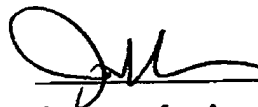
None of the other cited references teach the peak-like and valley-like shapes of a duplication plate material and those of an optically diffractive layer which are not formed to be completely complementary to each other. Moreover, none of the other cited references disclose duplicating an optically diffractive layer by using a duplication plate material designed to have all cross sectional areas above a midline of peak-like shapes are smaller than all cross-sectional areas below the midline of valley-like shapes adjacent to said peak-like shapes, the midline being a line drawn by connecting midpoints of the height of each peak-like shape, and a ratio of each cross-sectional area above the midline of each peak-like shape to each cross-sectional area below the midline of each valley-like shape is from 0.95 / 1.05 to 0.8/1.2, in order to finally obtain a desired optically diffractive structure in which the width of each valley-like shape and that of each peak-like shape are almost even so as to increase diffraction borrowed light. Therefore, the Applicant respectfully requests that all the obviousness rejections be deemed overcome.

In light of the foregoing response, all the outstanding rejections are considered overcome. Applicant respectfully submits that this application should now be in condition for allowance and respectfully requests favorable consideration.

Respectfully submitted,

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Date



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